KARNATAKA STATE AKKAMAHADEVI WOMEN UNIVERSITY, VIJAYAPURA

SYNOPSIS

"Evaluation of Antioxidant Activity, Nutrient Composition, Stability Study and Value Addition of Selected Peels of Fruits"

DEPARTMENT OF FOOD PROCESSING AND NUTRITION
KARNATAKA STATE AKKAMAHADEVI WOMEN UNIVERSITY, VIJAYAPURA

Submitted By

GANGUBAI P ABBIHAL
(KSAWUV /Ph.D/674/2020-21)
Research Scholar

Under the Guidance
of
Dr. SAVITA HULAMANI
Assistant Professor, Dept. of Food Processing & Nutrition,
Karnataka State Akkamahadevi Women University, Vijayapura

"EVALUATION OF ANTIOXIDANT ACTIVITY, NUTRIENT COMPOSITION, STABILITY STUDY AND VALUE ADDITION OF SELECTED PEELS OF FRUITS"

INTRODUCTION:

Vegetables and fruits yield about 25% to 30% of non-edible products such as peels and seeds. In most cases these waste by-products contain high contents of antioxidant and antimicrobial compounds that can be successfully utilized as a source of phytochemicals and antioxidant agents.(Sheila John et al., 2017)

Peel is generated as the primary by-product representing approximately 50–65% of the fruit weight. Peel and other by-products are usually discarded causing environmental issues due to being prone to microbial spoilage. The citrus fruits' by-products are important sources of bioactive constituents carrying health potential, hence, their utilization can, not only yield commercial benefits, but also help in countering environmental pollution problems arising due to their disposal (Mehmet Musa O¨ zcan et al.2020).

Fruits and vegetables are considered to be basically used food products being either fully cooked, nominally cooked or uncooked. It has been found that the processing of vegetables and fruits alone produces a notable waste of 25–30% of the total product. Furthermore, peels, pomace, rind and seeds are considered to be among the most common wastes.(Kumar, *et al*., 2020)

Oranges and lemons are important medicinal plants of the family Rutaceae. It is reported that their pulp as well as peel have antibacterial potential in addition to other properties (Parashar *et al.*, 2014).

The fruit and vegetable wastes are inexpensive, abundantly available and are a good source of dietary fibre. (Alkozai *et al* 2018).

Taking into concern the impact and economy of waste generated the present research investigation will be carried out under the following title i.e. **"EVALUATION OF ANTIOXIDANT ACTIVITY, NUTRIENT COMPOSITION, STABILITY STUDY AND VALUE ADDITION OF SELECTED PEELS OF FRUITS"**

Hence, the following objectives are to be proposed for the study:

OBJECTIVES:

1. To study the nutritional composition of selected peels powder
2. To study the total antioxidant activity of selected peels powder
3. Development of value added products from selected peels powder
4. Organoleptic evaluation of value added products
5. To estimate Nutritional composition of best acceptable value added products
6. To study the total antioxidant activity of best acceptable value added products
7. To study the shelf-life of best acceptable products
8. To study the microbial analysis of best accepted value added products

REVIEW OF LITERATURE:

Raj *et al*. (2012) studied the nutritional and sensory effects of supplementation of wheat bread with food industry by-products, orange peels, at 5, 7 and 10 per cent levels. Results indicated that the scores of bread containing 5 per cent orange peel flour were found to be most acceptable. At 5 per cent level of incorporation all the attributes scored highest score level. Peels of fruits contain more polyphenols than fruit itself(Kroyer, 2009)

Khattak, K. F. and Rahman, T. U. Carried out a study on Analysis of vegetable's peels as a natural source of vitamins and minerals. The study revealed that The vitamin C content of the peels ranged between 43.6 to 122.5 mg/100g, while riboflavin, thiamin and niacin levels were between 0.3 to 0.8 mg/100g, non-detection to 0.4 mg/100g and 0.2 to 1.6 mg/100g, respectively. Appreciable amounts of various minerals such as calcium, sodium, magnesium, iron, manganese, zinc, potassium and phosphorus were detected in the peel samples. The overall findings confirmed that peels are rich source of minerals and vitamins and can be utilized as food, feed and dietary ingredients after appropriate processing .

Figuerola *et al* (2005) studied and found high quantity of fibre i.e. 64.3 percent in fibre concentrates obtained from Valencia orange peel. They reported that orange peel contained a large amount of soluble sugars (46.649 per cent), whereas leaves contained only 10.134per cent. It was found that the protein content determined in orange peel was the half of that contained in the leaves i.e 16.897 and 8.015 per cent, respectively.

Ojha *et al*.,(2017) prepared mandarin peel powder wheat flour biscuits by incorporating 3,6 and 9 per cent of peel powder. It was reported that biscuits made from 6 per cent mandarin peel powder were comparable to control in overall acceptability while 9 per cent mandarin peel powder biscuits got lower scores

Srivastava et al. (2018) analyzed the nutritional composition of lemon peel powder and found it to be rich in dietary fiber (64.07%), total phenolic content (61.23 mg GAE/100 g), and flavonoid content (59.9 mg CE/g). They also reported that lemon peel powder contained 25.68 mg/100 g of ascorbic acid, contributing to its high antioxidant potential. Similarly, Bhatnagar et al. (2017) found that pomegranate peel powder contained a high amount of tannins, polyphenols, and flavonoids, which enhanced its functional properties in food applications.

Singh and Immanuel (2019) studied the antioxidant activity of citrus peel extracts and found that lemon peel powder exhibited strong DPPH radical scavenging activity (46.98% reduction), FRAP, and ABTS radical scavenging capacity. They also noted that pomegranate peel powder demonstrated superior antioxidant activity due to its high phenolic and tannin content, which provided strong oxidative stability.

Reddy et al. (2018) examined the storage stability of bakery products containing fruit peel powders and found that pomegranate peel powder significantly reduced lipid oxidation, improving product freshness. They reported that citrus peels contain natural antimicrobial and antioxidant compounds, which extend shelf life and prevent spoilage.

METHODOLOGY:

I PROCUREMENT OF RAW MATYERIALS:

The proposed study will be conducted in the department of food processing and nutrition, KSAWU, Vjayapura. The samples (raw materials such as lemon peel and pomegranate peel will be collected from local juice centres.

II PROCESSING OF SELECTED PEELS OF FRUITS BY FOLLOWING METHODS:

Washing (under running tap water)

Blanching (at 100ºC)

Drying (Sun drying)

III. TO STUDY THE NUTRITIONAL COMPOSITION OF SELECTED PEELS

PROXIMATE NUTRIENT COMPOSITION:

- Estimation of protein by Kjeldahl method
- Estimation of fat (AOAC official methods of analysis 2005)
- Estimation of total carbohydrates (Biochemical Methods by A. Manickam, and S. Sadasivam)
- Estimation of moisture using AOAC official methods of analysis (2005)
- Estimation of crude fibre(AOAC official methods of analysis 2005)
- Estimation of Ash using AOAC official methods of analysis (2005)
- Mineral element analysis by Atomic Absorption Spetrophotometer (AAS) – Fe, Ca, Zn, Na, K
- Phosphorous(AOAC official method, 931.01(2000) chapter 3, p.21.)

IV TO STUDY THE ANTIOXIDANT PROPERTIES OF SELECTED PEELS

- Vitamin C determination by indophenol method.
- Estimation of total phenolic will be determined by spectophotor method
- DPPH radical scavenging activity
- Ferric reducing antioxidant power(FRAP) assay

V DEVELOPMENT OF VALUE ADDED PRODUCTS FROM SELECTED PEELS

Different products will be prepared using using selected peels of fruits

- Bread
- Chakkali
- Khakhra
- Tea
- Tutti- fruit
- Cookies

VI ORGANOLEPTIC EVALUATION OF VALUE ADDED PRODUCTS PREPARED FROM SELECTED PEELS

The nine point hedonic scale will be used for scoring the samples on the basis of sensory properties like appearance, color, texture, flavor, taste and overall acceptability. The best acceptable product will be carried out for storage study.

VII STORAGE STUDIES OF THE SELECTED PEELS OF FRUITS

The storage study will be carried out by using storage methods like freezing and room temperature. And storage materials used such as zip logs and Polythene bags.

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